

# Utility Scale Solar Development: Stability Matters

**Utah Renewable Energy Business Summit  
November 15, 2010**

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LLP

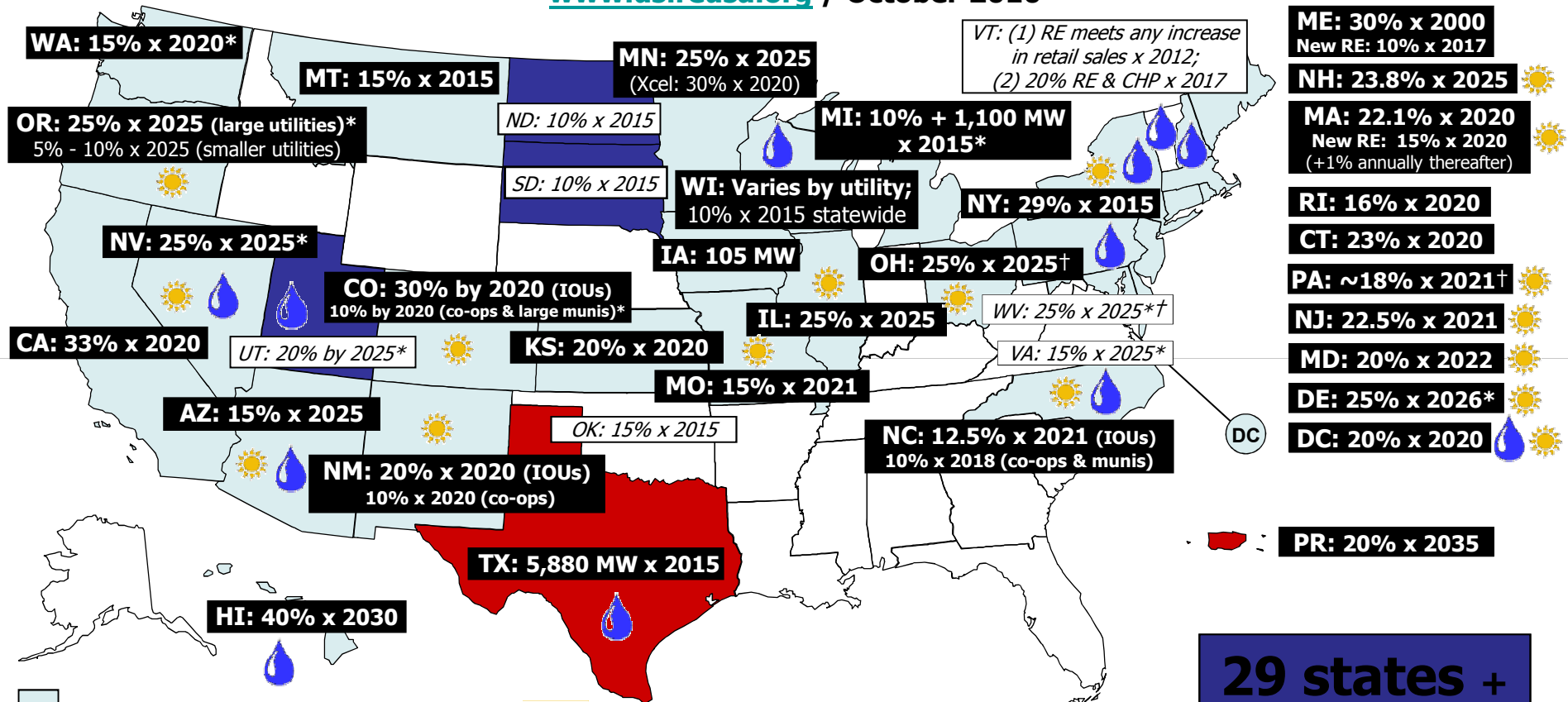


12/2/2010

# Policy Framework

# States with Renewable Portfolio Standards

[www.dsireusa.org](http://www.dsireusa.org) / October 2010



- Renewable portfolio standard
- Renewable portfolio goal
- Solar water heating eligible

- Minimum solar or customer-sited requirement
- \* Extra credit for solar or customer-sited renewables
- † Includes non-renewable alternative resources

**29 states + DC and PR have an RPS**  
(7 states have goals)

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# Utah State Incentives



## Renewable Portfolio Goal

Non-binding suggestion that utility pursue renewable energy if ☐cost-effective☐

## Incentives

**State Rebate Program: \$2/watt dc**

Max incentive for non-residential: 25% of eligible cost or \$50,000

Only available to governments, residential, non-profit, schools

**Utility Rebate: \$2/watt ac**

Max incentive: \$30,000 for non-residential

Annual program limit of 107 kW

Local and Other Tax Considerations

State tax credit: up to \$50,000 or 10% of reasonable cost of installation

Commercial only

Net Metering (2MW for non-residential limit)

Third Party Ownership Limited to public buildings, schools, or 501(c)(3) tax-exempt organization

# Investment Tax Credit (ITC)

Credit amount = 30% (or 10%) of the basis that a company has invested in an eligible property that is placed in service during 2006-2016 (rates vary by technology)

Credit amount based on expenditures, not energy production

Grant in lieu of credit through end of 2010

Production tax credits for most technologies may now be claimed as ITC instead of PTC (see attached table)

# Financing Study (2008)

Financing Options	Construction Cost per watt installed		
	Base Case** (\$8.50/watt)	Lower-cost \$7.00/watt	Lowest-cost \$6.00/watt
CREBs	<b>\$0.29/kWh</b>	<b>\$0.22/kWh</b>	<b>\$0.17/kWh</b>
Tax-exempt financing	<b>\$0.38</b>	<b>\$0.29</b>	<b>\$0.23</b>
Private owner with ITC	<b>\$0.23</b>	<b>\$0.17</b>	<b>\$0.13</b>
NMTC – no ITC (3.75% debt)	<b>\$0.29</b>	<b>\$0.22</b>	<b>\$0.17</b>
<b>NMTC – with ITC</b>	<b>\$0.19</b>	<b>\$0.13</b>	<b>\$0.10</b>

\* These costs represent the additional levelized net costs of power per kilowatt-hour over the expected life of the system (above current electricity costs), incorporating the value of future carbon credits, costs of personal property taxes, the value of solar RECs (a value of zero is assumed for Utah solar RECs because Utah currently has no mandatory RECs market), a 10% state renewable corporate tax credit capped at \$50,000, and power cost savings, assuming that utility rates increase at 3.5% per year.

\*\*At a cost of \$6.00 per installed watt, installing a 1 MW system would cost roughly \$6.0 million.

# Energy-Related Bonds

## Clean Renewable Energy Bonds (CREBs)

Finance solar and other renewable energy equipment to be owned by municipal utility, other state or local gov agency, electric co-op, or Indian Tribe

Little or no interest paid on bonds

Lender receives Federal tax credits

## Build America Bonds

Municipal utilities and other state and local governments can issue tax exempt bonds to finance infrastructure

Bonds bear interest, but at reduced rates because lenders do not have to pay income taxes on interest payments

Direct pay subsidies available

# Energy-Related Bonds

Recovery Zone Bonds (RZFB /RZED)

RZEDs must be issued by December 2010

RZFBs can be issued to finance projects in distressed areas but will be privately owned

Lender does not pay tax on interest

Qualified Energy Conservation Bonds (QECCB)

Issued by state and local governments

Can be used to finance many different types of “green” projects

Direct pay subsidy now available, and may be used for privately owned projects

Fixed allocation, but no expiration date

# Solar: Distributed Generation versus Utility Scale

## Green Energy Project Drivers

Issue	Distributed Generation	Utility-Scale
Obligated Output / Offtake	<b>Large, predictable needs</b>	<b>Firm offtake / PPA or predictable spot market</b>
Relative Prices	<b>High electricity / natural gas prices help</b>	<b>Same as DG</b>
Creditworthiness	<b>Credit Considerations Vary by Roles</b>	<b>Offtake / Transmission / Interconnection Key</b>
Other Regulatory Issues	<b>Level of Rebates / Status of State RPS</b>	<b>Climate Regulation / Federal RPS / Interstate Sales</b>

## Green Energy Project Drivers

Issue	Distributed Generation	Utility-Scale
Tax Incentives	<b>1603 Grant Simplifies Monetization</b>	<b>Same as DG plus ITC v. PTC choice</b>
Geographical Factors	<b>Rooftop / Open Space Near Consumption Best</b>	<b>Locations Near Transmission / Resource Best</b>
Regulatory Structure	<b>Net metering / interconnection key</b>	<b>Transmission / interconnection key</b>
Other Regulatory Issues	<b>Feed-in Tariff</b>	<b>QF Rate / PURPA</b>

# Recent Developments

# Federal Tax Innovations

Ability to elect ITC instead of PTC

1603 Grant in lieu of ITC

Under new ITC rules, no penalty for “subsidized energy financing”

Equipment leases to non-profits allowed under 1603 Grant

Expansion of New Markets Tax Credits (NMTC)

# Recent Regulatory Issues

## California Public Utilities Commission and FERC

FERC has weighed in on avoided cost methodology for  
Feed-in Tariffs

Can be multi-tier considerations based on state  
requirements

Previously, avoided cost involved a very technical  
evaluation

Could now include costs of complying with RPS / REC  
requirements

# Recent Regulatory Issues

## Transmission and Interconnection

Recent FERC decision announced a policy change allowing transmission rights squatters

Previously illegal to resell transmission rights at a profit

Incentive now for buy and hold strategy for parties seeking arbitrage profits

Important to lock-up transmission rights early in process

## Interconnection Agreements

Be aware whether project delays will be considered a “material modification” and whether project is still bound under original agreement

Question is whether the change impacts a third-party (e.g. another party undergoing an interconnection study)

## Recent Regulatory Issues

### Recent Idaho PURPA QF Proposal

Idaho investor-owned utilities recently proposed lowering the qualifying facilities (“QF”) system size cap from 10 MW to 100 kW, a 99% reduction

Under Federal law, QFs typically have the right to sell at an avoided cost rate or a negotiated rate

Small power production facilities (usually under 30 MW) may also be exempt from regulation as a public utility

Utilities claimed that the avoided cost model (using combined cycle natural gas generation as baseline) is insufficient due to intermittent nature of renewables

Previous efforts resulted in wind generation projects coming to standstill

## Examples of Innovative Utility-Scale Solar

City of Phoenix developing a 150 MW solar project and landfill gas project involving a private developer and private capital on city-controlled land

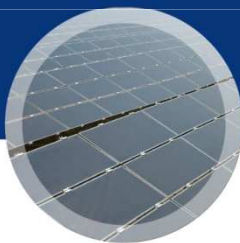
The City took a novel approach to “partnering” with a developer selected through an RFP

Exelon Solar Project in Urban Chicago

10 MW solar project on 41-acre brownfield owned by City

Utility-sponsored project working cooperatively with City of Chicago

# Utility-Scale Solar PV Development

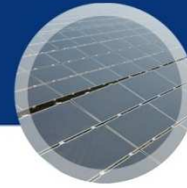


**Utah Renewable Energy Business Summit**

**Sandy, UT**

**November 15, 2010**





## Overview

- **enXco company overview**
- **Building largest ground-mount PV system in Pacific Northwest for PGE.**
- **Why Solar?**
  - **utility perspective**
  - **county perspective**
  - **landowner perspective**

# SOLAR ENERGY - Benefits

## Economic

- Additional revenue stream for Yamhill County tax base and landowners
- Harvesting solar resources diversifies the local economy
- Employ approximately 50 workers during design and construction
- Investment in local economy through purchasing materials, equipment rental, professional services
- No capital investment required from Yamhill County

## Environmental

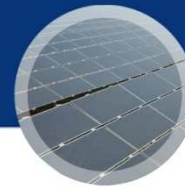
- Uses local, clean energy resource to meet the needs of approximately 2,300 homes at peak output
- Solar photovoltaic panels generate electricity without emitting pollutants or consuming water
- No environmental impact to natural habitats
- Project equipment easily removed after useful life and land returned to previous state
- Annually displaces 1,935 metric tons of carbon dioxide equivalent to emissions from 370 vehicles per year

\*<http://www.epa.gov/grnpower/pubs/calculator.htm>

## Energy

- Builds on legacy of self-sufficiency by using local resources
- Produces electricity during periods of highest demand on hot days
- No fuel cost or fuel supply risk
- No moving parts = less maintenance
- Diversifies PGE's electricity supply

# enXco Overview



## SPECIALIST IN RENEWABLE ENERGY

### Multiple Energy Segments



Wind

Solar

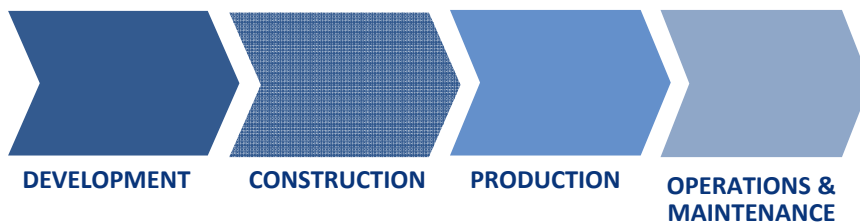
Biomass

Hydro

Landfill  
Gas

## INTEGRATED OPERATOR

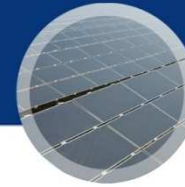
enXco covers the entire  
renewable energy value chain



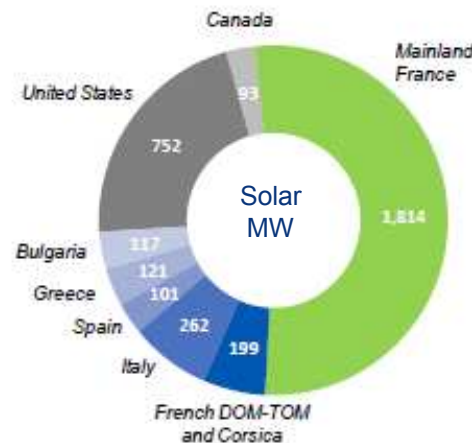
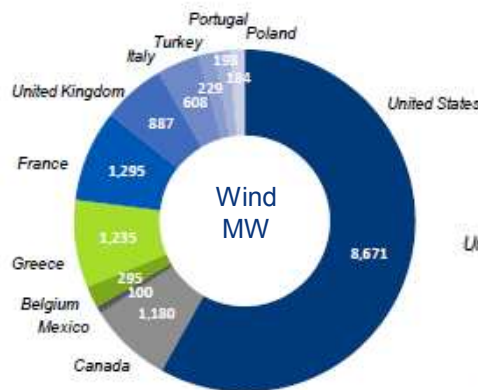
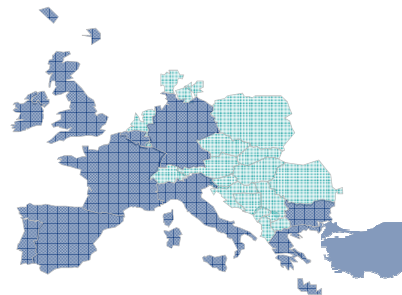
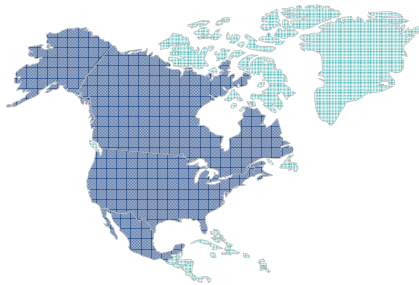
## OWNED BY ESTABLISHED ENERGY EXPERTS



# GLOBAL REACH



**A leader present in 10 European countries and the United States, Mexico and Canada**



**EXTENSIVE PROJECT PIPELINE**

## PROVEN TRACK RECORD

**4028** MW gross renewable capacity in service or under construction

**14,919** MW gross capacity for renewable projects under development

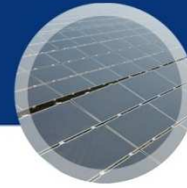
**3459** MW solar projects under development

## LARGE US PRESENCE

Over 650 employees in our US Business Unit



# Operations & Maintenance

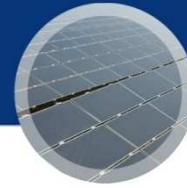


## *enXco is first in O&M...*

- Largest third-party provider of O&M services in North America
- 5,230 turbines under contract representing more than 4,500 MW
- 74 wind projects in 14 states, Canada and Mexico
- 300+ wind technicians



# Solar PV Development



## *Accelerating growth in solar PV...*

- Since 2008 developed & installed 30MW of Solar PV in North America, 142MW in Europe
- Currently in North America: 38MW under construction, 750 under development.



# POCONO RACEWAY GOES SOLAR



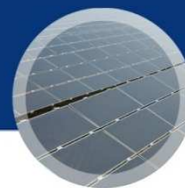
## *Staying ahead of carbon emissions issues...*

- On July 30, 2010 enXco dedicated the Pocono Raceway Solar Project.
- 3 MW, 25 acres of land, 40,000PV modules.
- Expected to reduce carbon emissions by an estimated 2,370 tons annually.
- Pocono Raceway will be the largest renewable energy stadium project in the world.



To view media coverage of this project visit:  
[www.cnn.com/2010/US/08/01/pennsylvania.pocono.raceway/index.html](http://www.cnn.com/2010/US/08/01/pennsylvania.pocono.raceway/index.html)  
Video with Ryan Newman and Alex Lazur: [NASCAR.com](http://NASCAR.com)

# Arnprior Solar Project



## *Large Scale Solar Facility...*

### •SYSTEM FACTS

**23.4 MW**

**312,000 Panels**

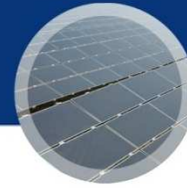
*Application Fixed Tilt Ground-Mount  
Technology Thin Film*

### •ECONOMIC ESTIMATES

The project employed ~150 local community trades during design, engineering, construction, resulting in **over \$20 million in local procurement for materials, equipment, and services.**



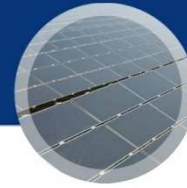
# Building Solar for NW Utilities



## *Solar PPAs with PGE...*

- Portland General Electric (PGE) largest utility in Oregon. 800,000+ customers
- Combined total of 2.84 MW (dc) of generating capacity at two sites.
- enXco will develop, build, and own the projects, PGE will purchase the power via 25-year PPA.
- Construction begin early 2011, commercial operation July 2011.
- enXco will operate and maintain the projects.

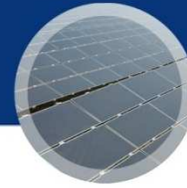




## **Bellevue and Yamhill PV Projects**

**- Total 2.84 MW dc**

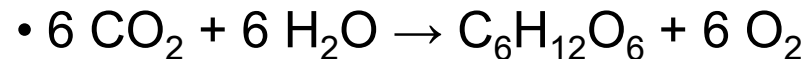
- **Won PGE's 2008 RFP**
- **PGE's interest in PV**
  - helps meet summer peak demand
- **Why Yamhill Co?**
  - zoning and planning clearly supports renewables
  - solar compatible with existing ag operations
  - renewable energy diversifies local economy
  - build on legacy of harvesting local resources



# Why Solar? A Farmer's Perspective

## 102 Year-old Family Farm

- **Already harvesting solar power for food, why not electricity?**



- **No conflict with current use**  
(barley, grass, hazelnuts)

- **Diversify operations**

- “Solar farming and dirt farming: energy is end product of both”

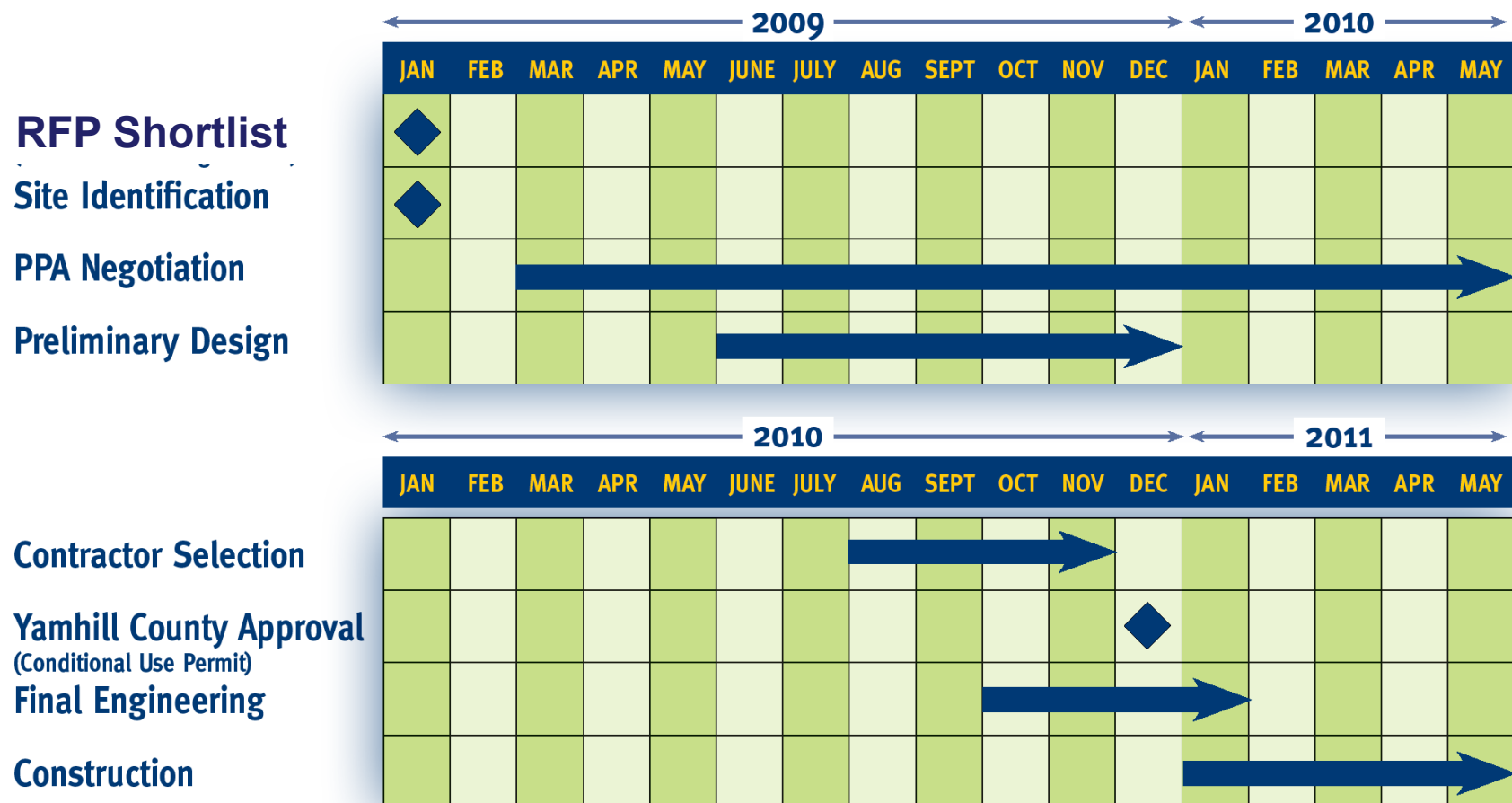
- **Guaranteed \$/acre**

- Can't get that with crops

- **Using natural resources locally = self-sufficiency**

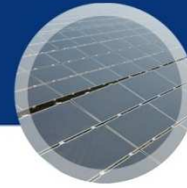


## Project Timeline



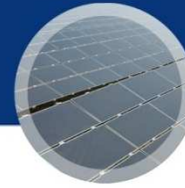
# Solar Construction





## Conclusion

- **enXco develops array of PV projects, (1.5MW to 30MW) across North America**
- **Common customer motivations & benefits**
  - Meet summer peak demand, diversify energy mix
  - Predictable price of electricity
  - Compatible with rural & urban land use
  - Harvesting local resources = self-sufficiency
  - Diversify farm/ranch operations & local economy



## To learn more about enXco:

[www.enXco.com](http://www.enXco.com)

[www.edf-energies-nouvelles.com](http://www.edf-energies-nouvelles.com)

enXco develops, constructs, owns, operates and manages renewable energy projects throughout the United States. For more than two decades, we have been a leader in wind-energy focusing on large-scale wind projects. Today enXco's portfolio includes solar and biomass technologies, in an effort to help drive our nation's transition to a sustainable energy economy. enXco is a significant owner and developer of wind-energy installations in the United States, and is the leading third-party operations & maintenance provider for wind farms in North America.

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# Utility Scale Solar Development

Utah Renewable Energy Business Summit

November 15, 2010



*Let's turn the answers on.*

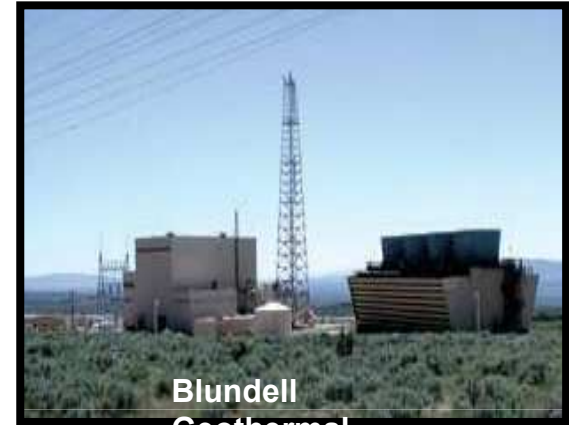
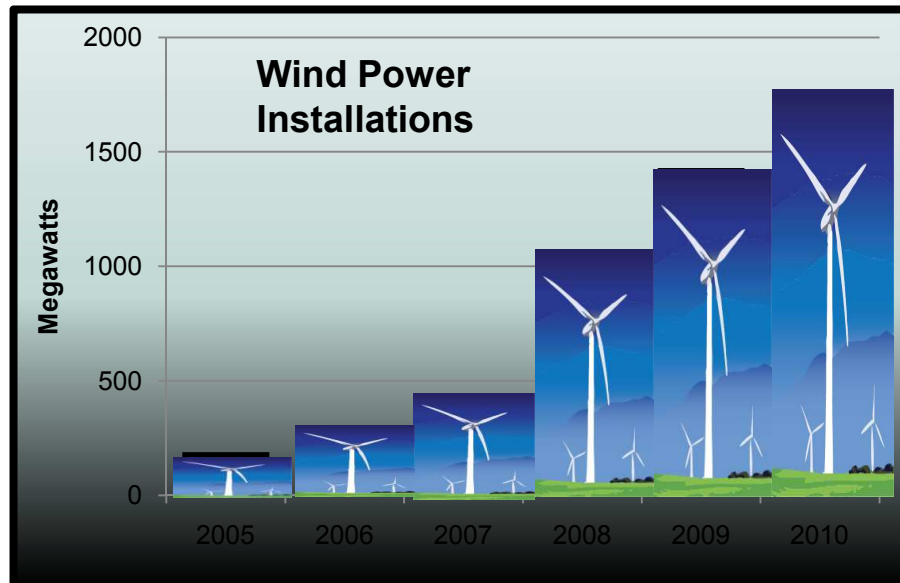
## Agenda

- **Rocky Mountain Power's success in developing renewable energy**
- **Current solar programs**
- **Challenges of utility scale solar development**
- **Potential opportunities for additional solar energy development**

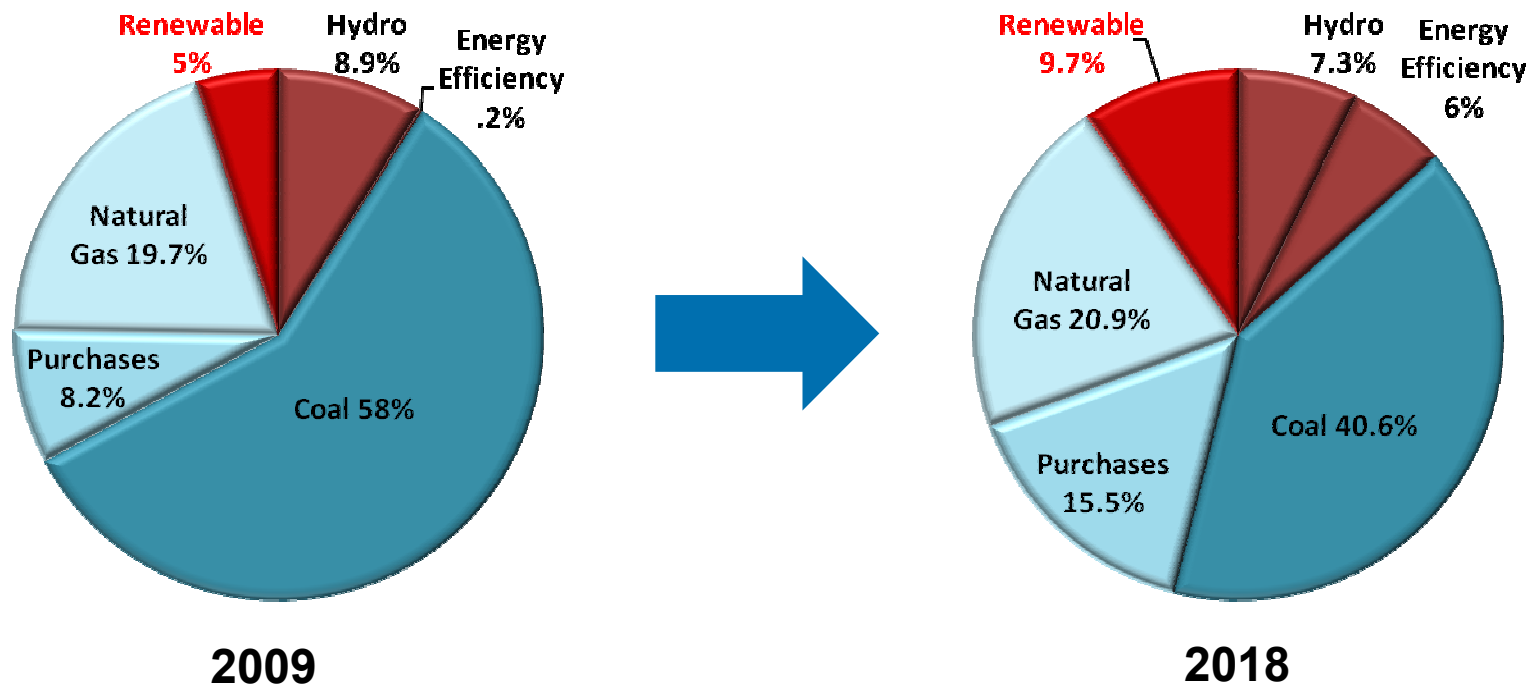


Rocky Mountain Power is a leader  
in cost-effective renewable electricity

- Second largest utility-owner of wind in the U.S.
- 27-fold increase in wind energy since 2006
- Power output = annual electric usage of about 375,000 homes
- Blundell Geothermal in 1984, expanded in 2007



## Plan to nearly double cost-effective renewable energy by 2018



***We are doing our part to meet Utah's renewable goal of 20% by 2025***

## Voluntary renewable energy programs

### Blue Sky

- #2 nationally in participants: 28,000 businesses and households in Utah
- Funded 41 community projects in Utah
- Environmental benefits equivalent to planting nearly 11 million trees

### Utah Solar Pilot

- **Designed to obtain solar power knowledge in Utah**
- **\$600,000 in incentives through 2009**
- **Funded 72 residential and 11 commercial projects**

### Customer generation – Net Metering

- **Participants are credited the retail price for excess power**
- **640 participants in Utah--and growing**
- **Partnered with Salt Lake County to announce the largest roof-top photo voltaic project in the U.S.**



# IRP Overview

## Goals of IRP:

- Plan for new resources to provide reliable service
- Gain key stakeholder involvement and commitment
- Comply with state Commission requirements
- Foundation for future investment and long term business planning

- **IRP goal is to achieve balance**
  - Load and resources
  - Cost and risk
  - Societal & environmental concerns and safe, reliable power
- **The IRP serves as a roadmap for future resource requirements over a 20 year time frame**
- **The IRP includes:**
  - Timing, type, and magnitude of new resource decisions
  - Timing and magnitude of new transmission investment
  - Estimates of new resource options and costs
  - The least-cost, low risk portfolio of new resource options to serve the customer and balance the system

## **Utah PSC IRP Standard**

- **Evaluates all known resources on a consistent and comparable basis**
- **Meet current and future customer electric energy services needs**
- **Lowest total cost to the utility and its customers**
- **Consistent with the long-run public interest**
- **Given the expected combination of costs, risk and uncertainty**
- **(Report and Order in Docket 90-2035-01, dated June 18, 1992)**

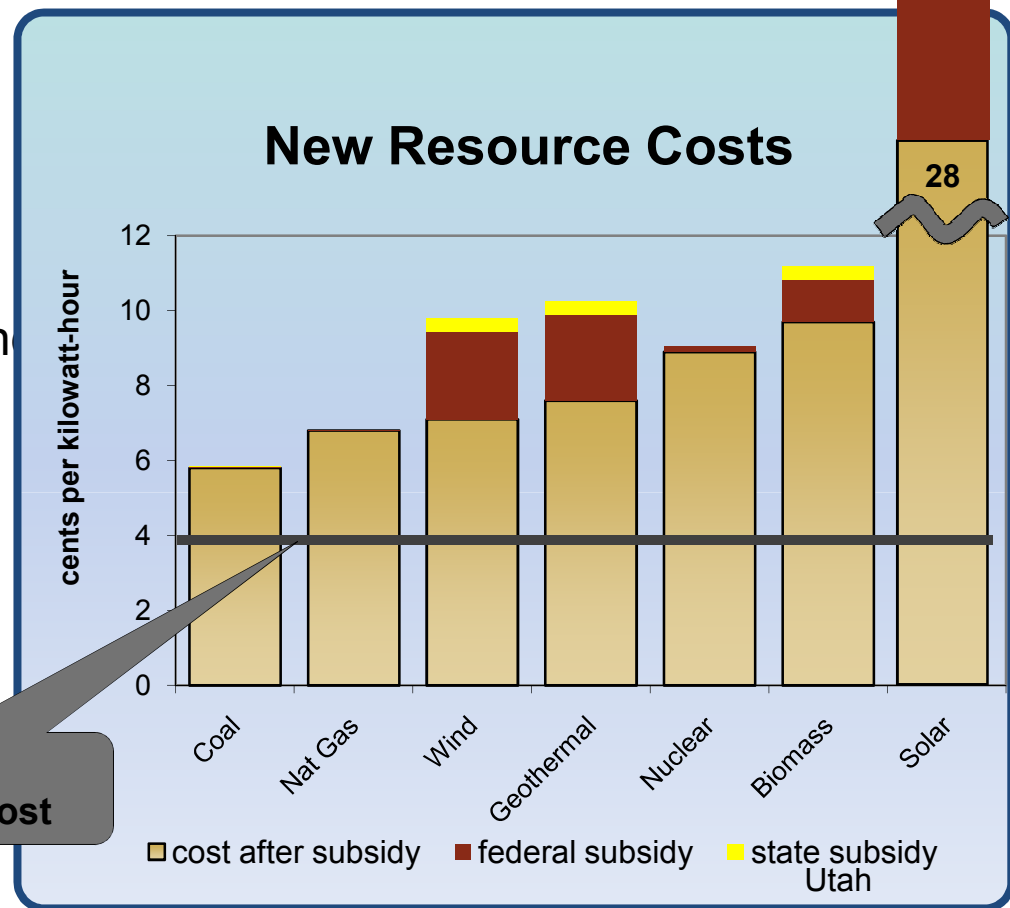
## 2008 IRP - Solar Results

- **Defined 57 resource portfolio development scenarios that included utility-scale solar thermal as a resource option**
- **Emerging technologies rarely selected by the capacity expansion model**
  - Two portfolios included solar with natural gas backup: 500 MW (250 MW in 2014 and 2015)
  - Solar was economic with a minimum \$45 CO<sub>2</sub> tax combined with high load growth and gas prices

## Renewable energy challenges - Costs

- High cost is barrier to development
- Tax credits required to make win cost-effective
- Transmission lines needed; expensive and hard to site

existing  
generation cost

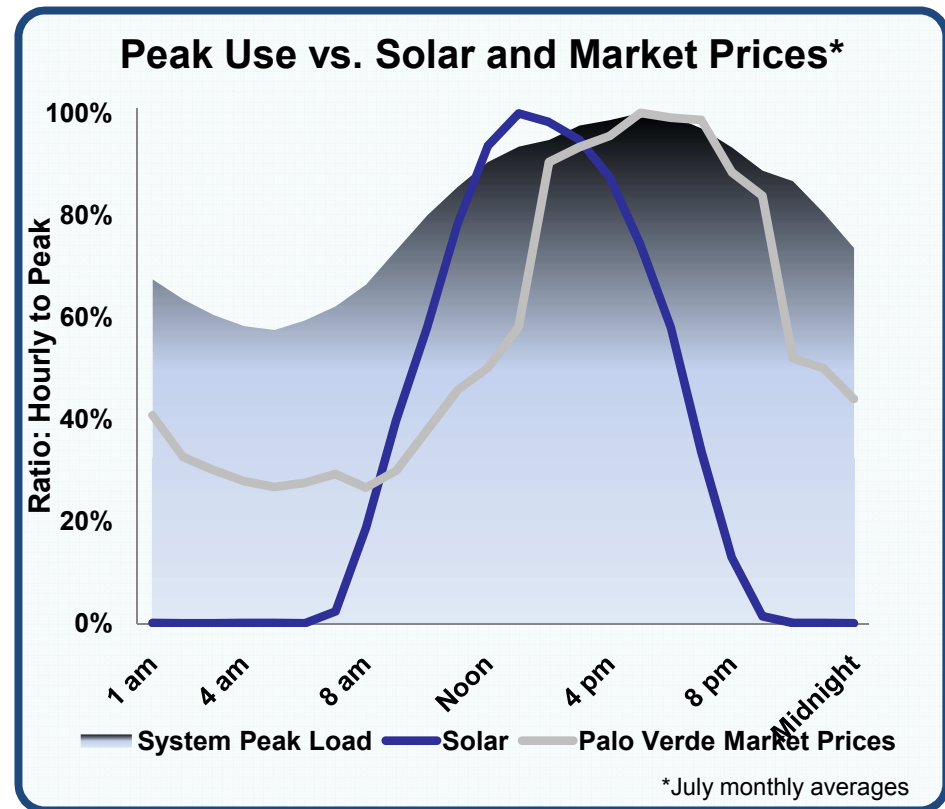


Source: Standard & Poor's, U.S Energy Information Administration & state statute

***State policy requires utilities to provide electricity at a least-cost standard***

## Solar energy challenges – Peak

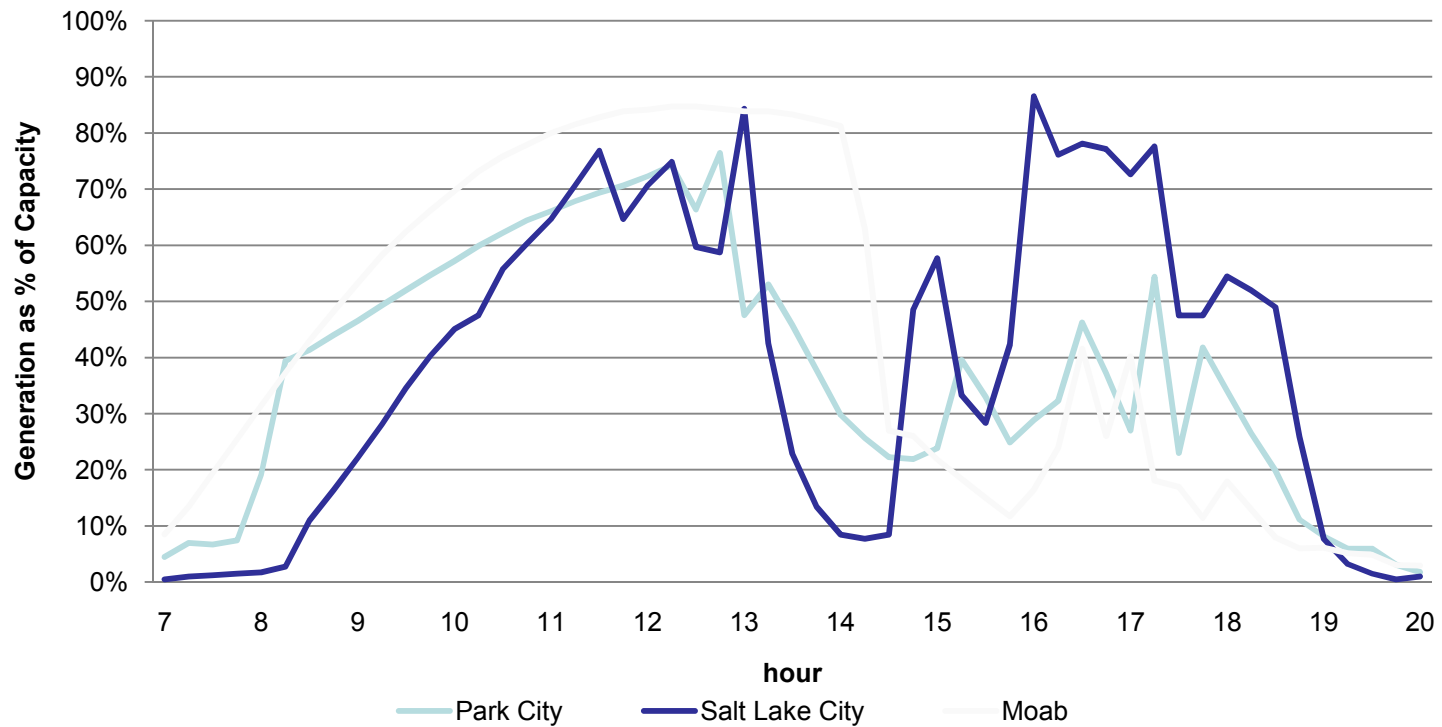
- Solar does not make significant contribution at peak use times (**red**)
- Renewables require backup or energy storage to meet customers' peak needs (**blue**)
- Market prices are highest during peak use (**green**)



*The graph depicts the timing of the maximum of the curves, not the absolute amounts*

## Solar energy challenges – Intermittent

**Solar Generation on 15-minute Interval**



## Residential and small business options

**Some customers want to participate in the direct benefits of renewable energy projects**



### ***Possible Approach: Ownership Option*** **SunSmart Model (St. George)**

- ✓ Interested customers buy shares of utility-built renewable project
- ✓ Participants share benefits of a renewable project they can't install alone
- ✓ Virtual Net Metering

### ***Possible Approach: Tariff Option***

- ✓ Interested customers subscribe to purchase energy needs from utility-built or contracted renewable project
- ✓ Pay a premium for renewable energy
- ✓ Other tariff components continue to apply

## Large commercial and industrial customer option

**Some companies have corporate goals to reduce their carbon footprint.**

**They have expressed willingness to pay more for renewable energy.**

*Possible Approach: Ownership Option*

- ✓ **Interested customer owns or leases dedicated renewable energy project**
- ✓ **Renewable energy wheeled to customer facility to offset load**
- ✓ **Customer takes back-up service from utility**

*Possible Approach: Tariff Option*

- ✓ Opt-in dedicated utility owned or contracted renewable energy project
- ✓ Customers pay a premium for equivalent renewable energy from the project
- ✓ Other tariff components continue to apply

